Katadyn – Guide

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Device Information

The Katadyn Guide is a handheld pump water treatment device with microfilter treatment technology. Containing what the manufacturer terms "AntiClog Technology", the device consists of 143 square inches of pleated 0.3 µm glass fiber media, with an activated carbon core. This device creates an absolute barrier to contaminants greater than the pore size and may remove taste and odor through carbon filtration. This device contains no chemicals and requires no wait time. It is recommended that the initial liter of water be discarded due to carbon fines. During subsequent use, it is recommended that the first 5 - 10 strokes worth of water be discarded to remove stale water from the device. The device consists of a plastic housing, 130 µm pre-filter, glass fiber microfilter with activated carbon core, universal bottle adaptor for product water, and tubing. The pre-filter is fitted with a weight and adjustable float to keep it submerged, yet off of the bottom of the water source to limit the introduction of sediment to the filter. Additionally, pump lubricant and a carry bag are included with the device. Newer versions of this device may include a removable filter protector, and a hydration pack quick connect fitting. The filter protector supplies an extra barrier to extend the microfilter life by reducing particulate matter, but it is unlikely to increase microbial pathogen reduction. The quick connect fittings allow for easy filling of a hydration pack. This device is designed for bacteria and cyst reduction. The manufacturer makes no virus reduction claims.

Effectiveness Against Microbial Pathogens

No laboratory results were obtained that challenged this device to demonstrate pathogen reduction. This device utilizes identical pathogen reduction mechanisms as the Katadyn Hiker and therefore the results reviewed for that device were deemed applicable to the Katadyn Guide. Independent laboratory results were received challenging the Katadyn Hiker (tested under a previously brand name) against a modified version of the U.S. Environmental Protection Agency (USEPA) Guide Standard and Protocol for Testing Microbiological Water Purifiers (reference 1). Results for bacteria challenge showed reduction of > 6-log based on geometric averages of samples collected (references 2, 3). Data collected for *Cryptosporidium* reduction met the > 3-log reduction requirement of reference 1 (references 2, 3). Since the primary reduction mechanism is size exclusion, and because *Giardia* cysts are larger in size than C*ryptosporidium* oocysts, similar results for *Giardia* reduction can be assumed. This device is not designed for virus reduction and therefore, no data was reviewed for reduction of this pathogen. This device is assigned one √ for bacteria and cyst reduction

(for an explanation of the rating checks click here) based on size exclusion by the glass microfilter. Since the device is not designed, and has no mechanism, for virus reduction, the device is assigned one X for this pathogen.

Table. Expected Performance Against Microbial Pathogens.

Microbial Pathogen Type	Expected Disinfection Capability	Evaluation Rating	Pathogen Reduction Mechanism
Bacteria	> 6-log	√	size exclusion
Viruses	not effective*	X	none
Giardia cysts	> 3-log	√	size exclusion
Cryptosporidium oocysts	> 3-log	√	size exclusion

* additional treatment required for virus reduction.

Production Rate and Capacity

Inherent to the production rate and capacity of filtration devices is the quality of the raw water source. The manufacturer stated production capacity of the device is 750 L at a rate of 1.5 L/min. User effort is stated to be 36 strokes/L. This device utilizes a glass depth microfilter. The filter cannot be backwashed, and once clogged must be replaced. If clogged, a small amount of water may be produced if the filter is removed and swished in water (raw water acceptable). The filter protector should extend the life of the microfilter, but clogging may still occur, dependent upon the raw water quality. The filter protector is a removable coarse material that can be scraped clean and swished in water to remove particulates. The capacity of this device will vary widely with raw water turbidity.

Cleaning, Replacement, and End of Life Indicator

This device cannot be backwashed to remove sediment from the filter. When the device becomes unusable due to decreased production rate, the clogged filter must be replaced. The filter protector can be removed, cleaned and reused. The device contains no end of life indicator short of filter clogging. Since the device works solely on size exclusion, as long as the device will process water, stated pathogen reductions should be valid. The carbon core will eventually become exhausted. Since little or no pathogen reduction is attributed to the carbon core, if it

were to be exhausted prior to clogging of the microfilter, microbial quality should be unchanged. No data was presented to determine the capacity of the carbon core.

Weight and Size

Guide	400 grams
Size (height x diameter)	25 cm x 7 cm
Tubing, 2 pieces (length, each)	92 cm

Cost

Guide	$85.00
Guide replacement filter (glass microfilter, carbon, filter protector)	$35.00

Device Evaluation

The Katadyn Guide utilizes a 0.3 µm glass microfilter and granular activated carbon core for the reduction of bacteria, and cysts, as well as taste and odor. The Katadyn Guide utilizes the same reduction mechanisms as the Katadyn Hiker and, therefore, in the absence of data specific to the Guide, results for the Hiker were reviewed for this analysis. Independent data for the Katadyn Hiker showed reduction of bacteria and cysts by > 6-log and > 3-log, respectively. Due to data not specific to this device, one check each for reduction of cysts and bacteria is assigned. This rating states that, due to the device technology, expert opinion believes that the device should be able to meet the bacteria and cyst reduction requirements of reference 1 (reference 4). More independent laboratory data specific to this device is necessary to confirm these reductions. Since the device reduction mechanism is size exclusion by means of a 0.3 µm microfilter, no virus reduction is claimed by the manufacturer. Additional treatment is required to fully meet the requirements of reference 1 and ensure adequate reduction of all three classes of microorganism. This device, like all filters with small pore sizes, is highly affected by turbid (cloudy) waters. This device utilizes no chemicals and requires no wait time prior to water consumption. There is no indicator of process failure or end of device useful life except filter clogging or the user keeping track of the volume of water produced. No manufacturing information or quality control data was received for this device. The manufacturer states ISO 9000 certification. No information was received on the storage life or required storage conditions for this device.

Advantages

- Based on treatment technology and limited independent data reviewed, this device should be capable of reducing bacteria and cysts to within the requirements of the USEPA Guide Standard and Protocol for Testing Microbiological Water Purifiers (reference 1).
- No wait time prior to water consumption.
- Activated carbon core should reduce taste and odors.
- Simple and lightweight.

Disadvantages

- Device is not designed for virus reduction and, therefore, unable to fully meet the pathogen reduction requirements of the USEPA Guide Standard and Protocol for Testing Microbiological Water Purifiers (reference 1).
- Additional treatment required.
- Small pore size of filter makes device inherently susceptible to clogging by waters with elevated turbidities.
- Device unable to be backwashed.
- No real-time indicator of process failure.

References

1. USEPA, 1989. Guide Standard and Protocol for Testing Microbiological Water Purifiers. *Federal Register*. 54:34067.

2. Independent laboratory results of tests showing bacteria and cyst reduction, 1996. Provided by Katadyn.

3. Independent laboratory results of tests showing bacteria and cyst reduction, 1995. Provided by Katadyn.

4. U.S. Army Center for Health Promotion and Preventive Medicine, 2005. *Technical Information Paper; Filtration in the Use of Individual Water Purification Devices,* Aberdeen Proving Ground, MD.